

Work Order ID 137312

137312

U/R

Page 1

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID: URF 15-561

Item Name: 412 Stainless Steel Aft Crosstubes - High

Stop

NS2

Start Date: 9/25/15 Start Qty: 1.00

1

Cust Item ID:

Required Date: 9/25/15 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: MLJ

Date: SEP 25 2015

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

NR1

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D412-664-443	A U/R OK 15/11/29	DAS 6 9-89							
100	Document Control	0.00							
100	DOCUMENT CONTROL								
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy bluefile & type labels per PPPD412-664-403								
110	BENDING MACHINE - CROSSTUBES	0.00							
110									
CNC Bend 2	Memo	0.03							
CNC Alpha 160 Bender	Bend tube as per Dwg D412-664-443 using CNC bender program _____ and Folio FT _____								
	****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS****								
127	QC15- Crosstube Dimensional Check	0.00							
127									
QC	Memo	0.00							
Quality Control	***MARK CUT LINES***								

MLJ 15-11-13

DAS
38
9-89

15-11-16

15-10-19

JAS
49
9-89

15/10/19

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By _____ Lead hand / Supervisor Approval Verification _____ QC / QA Coordinator Approval _____		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY							
Environment	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐	Power Loss/Surge	☐	Positioned Wrong	☐
Design	☐	Operator	☐	Bending	☐	Set-up	☐	Folio/Program	☐	Outside Dimensions	☐
Doc/Data	☐	Offset/Setup	☐	Centre Not Concentric	☐	BOM/Route	☐	Grain	☐	Over/Under tolerance	☐
Equip/Tooling	☐	Supplier	☐	Cracks	☐	Broken/Damage/Defect	☐	Weld	☐	Part Incorrect	☐
Handling/Pre	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified	☐	Wrong Stock Pulled	☐	Part Lost/Missing	☐
Material	☐	Use for Testing	☐	Cuffs	☐	Contamination	☐	Out of Sequence	☐	Part Moved	☐
Internal Transport	☐	Poor Information	☐	Crushing	☐	Countersink	☐	Off-set	☐	Drawing	☐
Tribal Knowledge	☐	Rushing	☐	Heat Treat	☐	Cut Too Short	☐	Mislabeled	☐	Finish	☐
LOA	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐	Fit/Function	☐	Misread	☐
Substation	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐	Misaligned/off center	☐	Turning Sequence	☐
Past Expiry Date	☐	Manufacturing Process	☐	OTHER : _____							
Misidentified	☐	Past Due	☐								

Work Order ID 137312

Thursday, September 24, 2015 1:30:38 PM

137312

Page 2

Item ID: D412-664-403 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: URF 15-561 Stop ***NS2***
Item Name: 412 Stainless Steel Aft Crosstubes - High
Start Date: 9/25/15 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 9/25/15 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
128		0.00							
128									
Crosstubes	Memo	0.01							
Crosstubes	CUT TUBE AT HEIGHT ON FAI SHEET								
	VERF HEIGHT <u>24.37</u> BY QC 15 LEVEL INSPECTOR <u>mmk</u>								
	VERF TWIST <u>0.190</u> BY QC15 LEVEL INSPECTOR <u>mmk</u>								
130		0.00							
130									
Crosstubes	Crosstubes								
Crosstubes	Memo	0.03							
	1- Drill Tube as per Dwg D412-664-443 Using DT <u>8559/8581</u> Drill Jigs,								
	Set-up drill table as per QSI 010								
	2-Deburr								
	3- Engrave Part # and Batch # as per Dwg D412-664-443								
	4-Remove all marks from tube within limits of D412-664-43 DWG. — <u>BL</u>								

BL 15/10/19
BL 15/10/20
BL 15/10/21

DQA: _____ Date: _____



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137312

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Thursday, September 24, 2015 1:30:38 PM

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Revision ID: URF 15-561 Stop *NS2*
Item Name: 412 Stainless Steel Aft Crosstubes - High
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Required Date: 9/25/15 Req'd Qty: 1.00 *1* Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140 *140* QC Quality Control	DAS 38 QC6- Inspect dimensions to drawing 9-89 Q65 Memo	0.00 0.00				1			DAS 38 9-89 OCT 21 2015
174 *174* Outsource2 Outsource process - NDT	Outsource process - NDT per QSI038 4.1 Memo ISSUE P/O TO ACCUREN: 30242	0.00 3.00							CZ OCT 23 2015 /
176 *176* Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs Memo	0.00 0.00							6 OCT 23 2014 DAS 6 9-89

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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Thursday, September 24, 2015 1:30:38 PM

137312

Page 4

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID: URF 15-561

Item Name: 412 Stainless Steel Aft Crosstubes - High

Stop

NS2

Start Date: 9/25/15 Start Qty: 1.00

1

Cust Item ID:

Required Date: 9/25/15 Req'd Qty: 1.00

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

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Stop

NR2

Sequence ID/Work Center ID	Operation Description	Set Up/Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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178

QC5- Inspect part completeness to step on W/O

0.00

178

QC

Memo

0.00

Quality Control

QB
15-10-29

180

SprayPaint

0.00

180

SprayPaint

Memo

0.01

Spray Painting

1-Prime inside & outside crosstube as per QSI 005 4.2
BATCH: 133084

2- MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG BEFORE PAINTING

3 -Paint Outside of Tube as per Dart QSI 005 4.2
BATCH: 133325

4- After painting remove masking and apply matte clear coat per QSI005 4.2
CLEAR BATCH: 132664

DAS
41
9-89

15-10-29

SEE OVER

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

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OTHER :																																																																							

Work Order ID 137312

Thursday, September 24, 2015 1:30:38 PM

137312

Page 5

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID: URF 15-561

Item Name: 412 Stainless Steel Aft Crosstubes - High

Stop

NS2

Start Date: 9/25/15 Start Qty: 1.00

1

Cust Item ID:

Required Date: 9/25/15 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

190

QC14- Inspect Spray Paint

0.00

100

QC

Memo

0.00

Quality Control

DAS
38
9-89

NOV 13 2015

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment ☐	☐	No Re-verification ☐		☐	Temperature/Cure ☐	☐	Power Loss/Surge ☐
Design ☐	☐	Operator ☐		☐	Set-up ☐	☐	Folio/Program ☐
Doc/Data ☐	☐	Offset/Setup ☐	☐	Pressure/Forced ☐	BOM/Route ☐	☐	Grain ☐
Equip/Tooling ☐	☐	Supplier ☐	☐	Bending ☐	Broken/Damage/Defect ☐	☐	Weld ☐
Handling/Pre ☐	☐	Training ☐	☐	Centre Not Concentric ☐	Inspection Incomplete/Unqualified ☐	☐	Wrong Stock Pulled ☐
Material ☐	☐	Use for Testing ☐	☐	Cracks ☐	Contamination ☐	☐	Out of Sequence ☐
Internal Transport ☐	☐	Poor Information ☐	☐	Crimp/Kink/Ripple/Wave ☐	Countersink ☐	☐	Off-set ☐
Tribal Knowledge ☐	☐	Rushing ☐	☐	Cuffs ☐	Cut Too Short ☐	☐	Mislabeled ☐
LOA ☐	☐	Product Improvement ☐	☐	Crushing ☐	Instructions Incomplete/Unclear ☐	☐	Fit/Function ☐
Substation ☐	☐	Process Improvement ☐	☐	Heat Treat ☐	Drill Holes ☐	☐	Misaligned/off center ☐
Past Expiry Date ☐	☐	Manufacturing Process ☐	☐	Wave/Twist in Tube ☐			
Misidentified ☐	☐	Past Due ☐	☐	Marks/Chatter ☐			
OTHER :							

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Page 6

NS1

Stop *NS2*

Customer:

Run Start *NR1*

Stop ***NR2***

**Insp.
Stamp**

0.01

Memo

12. Install supports clamps using as per Dwg D412-644-443. Install clamp with rubber cushion as per DWG. note 13. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT*** Torque clamps on support to 80-100 IN-LBS AS PER DWG.

A/R scoth-weld DP460 BATCH #: 132895
EXP DATE: 8/16

2- ****IF NOT ALREADY PRESENT ON CHAFFING SHIELD.**** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. Install and torque clamps on chafing shield to 40-50 IN-LBS AS PER DWG.

A/R Proseal 890 Batch: 133071
EXP DATE: 2/16

AFTER FINISH CURE TIME 24H
START CURE TIME: 15-11-10
FINISH CURE TIME: 15-11-11

PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
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Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
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Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER :							
Misidentified ☐	Past Due ☐								

Work Order ID 137312

Thursday, September 24, 2015 1:30:38 PM

137312

Page 7

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID: URF 15-561

Item Name: 412 Stainless Steel Aft Crosstubes - High

Stop

NS2

Start Date: 9/25/15

Start Qty: 1.00

1

Cust Item ID:

Required Date: 9/25/15

Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp
DAS
38
9-89

210

QC5- Inspect part completeness to step on W/O

0.00

210

QC

Memo

0.00

Quality Control

PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER
CURED FOR 24H.

NOV 13 2015

220

Pick Kit

0.00

220

Packaging

Memo

0.00

Packaging

DAS
6
9-89DAS
28
9-89

NOV 11 2015

230

QC4- 100% Inspect kits for completeness

0.00

230

QC

Memo

0.00

Quality Control

DAS
38
9-89

15-11-16

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
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Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
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Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
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Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								

Work Order ID 137312

Thursday, September 24, 2015 1:30:38 PM

137312

Page 8

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID: URF 15-561

Item Name: 412 Stainless Steel Aft Crosstubes - High

Stop

NS2

Start Date: 9/25/15 Start Qty: 1.00

1

Cust Item ID:

Required Date: 9/25/15 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

240

240

Packaging

Packaging

0.00

Memo

0.00

Identify and pack for shipping as per PPPD412-664-443

Location: BSK 1002

PPP Rev: _____

D412
6
9-25

NOV 18 2015

250

250

QC

Quality Control

QC21 - Final Inspection - Work Order Release

0.00

Memo

0.00

MW

NOV 19 2015

JH 20151118

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
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LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								

Picklist Print

Thursday, September 24, 2015 1:30:37 PM

Page 1

Work Order ID: 137312

137312

Parent Item: D412-664-403

D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 9/25/15

Required Date: 9/25/15

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A 13.10.25 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
AN6-40A		Purchased	No			220	Each	120.0000	4	4			
AN6-40A	DAS 38 9-89								**				
3/8-24 BOLT X 3" LONG												DAS 6 9-89	DAS 28 9-89
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST286A		120							
				M131618		20							
				M131803		100							
AN6-41A		Purchased	No			220	Each	73.0000	2	2		DAS 6 9-89	DAS 28 9-89
AN6-41A	DAS 38 9-89								**				
Bolt													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST286A		62							
				M129913		2							
				M131957		60							
				ST333		11							
				M131618		11							
AN960JD616	NAS1149D06631	Purchased	No			220	Each	0.0000	18	18			
AN960JD616	DAS 38 9-89								**				
Washer													
D3595-063-530		Manufactured	No			200	Each	102.0000	2	2		DAS 41 9-89	DAS 28 9-89
D3595-063-530									**				
Rubber Cushion 0.63" wide x 5.30" Long													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				FG		1							
				82656		1							
				LG051		101							
				115704		26							
				132515		75							

NOV 11 2015

DAS
28
9-89

DAS
41
9-89 15-11-10

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
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								QC / QA Coordinator Approval	
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Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER :							
Misidentified ☐	Past Due ☐								

Picklist Print

Thursday, September 24, 2015 1:30:37 PM

Page 2

Work Order ID: 137312

Parent Item: D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

137312

D412-664-403

Start Date: 9/25/15

Required Date: 9/25/15

Start Qty: 1.00

Required Qty: 1.00

D412-664-443TRN

Manufactured No

110

Each

0.0000

1

D412-664-443TRN

Crosstube Turning Detail

D4909-1

Manufactured No

200

Each

12.0000

1

D4909-1

Support

Location

Loc Qty

Loc Code

LG053

12

130094

2

135507

10

D4910-1

Manufactured No

200

Each

12.0000

2

D4910-1

Chaffing Shield

Location

Loc Qty

Loc Code

LG054

12

134367

2

135444

10

MS21042L6

Purchased No

220

Each

377.0000

6

MS21042L6

Nut

DAS
38
9-89

**

DAS
6
9-89

DAS
28
9-89

NOV 11 2015

Location

Loc Qty

Loc Code

ST260a

100

m133031

100

ST273A

155

m131624

155

ST305

105

m129909

1

m132262

4

m133134

100

t260a

17

m131317

17

Thursday, September 24, 2015 1:30:37 PM

Shop Packet Print

Page 2

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐		OTHER : _____					

Picklist Print

Thursday, September 24, 2015 1:30:37 PM

Page 3

Work Order ID: 137312

137312

Parent Item: D412-664-403

D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 9/25/15

Required Date: 9/25/15

Start Qty: 1.00

Required Qty: 1.00

MS21920-26

Purchased

No

200

Each

18.0000

4

4

MS21920-26

Clamp

DAS

41

9-89

15-11-10

Location

Loc Qty

Loc Code

LG050

8

109206

6

M132045

2

LG057

10

M133234

10

4

MS21920-28

Purchased

No

200

Each

196.0000

2

2

MS21920-28

Clamp

DAS

41

9-89

15-11-10

Location

Loc Qty

Loc Code

FG

1

105884

1

LG050

128

M130400

50

M130665

2

M133090

38

M133091

38

LG051

67

M132169

29

M132522

38

2

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

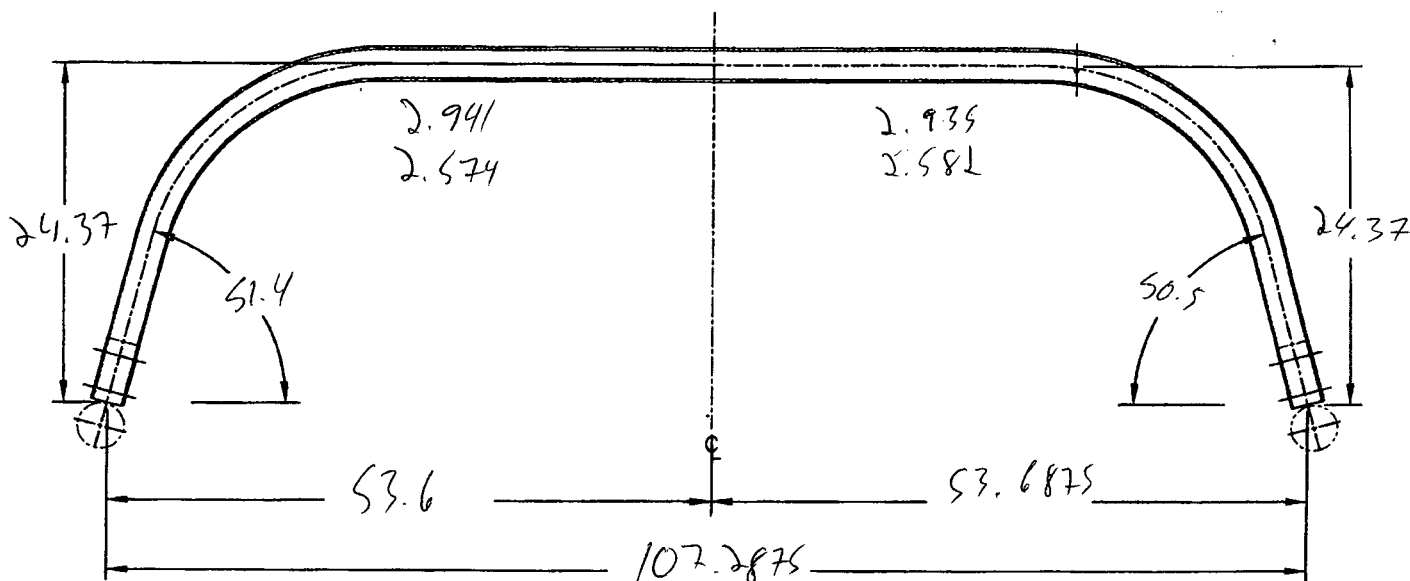
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐																																																																																																																																																							
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DART AEROSPACE LTD		Work Order: 137312
Description: Crosstube High Aft (412)		Part Number: D412-664-403
Inspection Dwg: D412-664-443	Rev: A	Page 1 of 1

Required Dimension	Min	Max
Height	24.12	24.62
1/2 Span	53.56	53.82
Angle	49°	52°
Total Span	107.12	107.64
Bending Passes	8	--
Crushing	--	7%



	Side A	Side B
Bending Passes	5	5
Crushing	6.6%	6.3%
Comments		

QC15 Inspection	DAS
Date	49 15/10/19
	9-89

Rev	Date	Change	Revised by	Approved
A	14.07.08	New Issue	KJ	UP

Item	Qty -443	Part Number	Description
1	X	D412-664-443	CROSSTUBE ASSEMBLY (412 HI AFT)
2	1	D6020-132	CROSSTUBE MATERIAL (132" MIN. LENGTH)
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-132
FINISHED LENGTH = 130.10±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-664-443" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 90.2 lb AFTER MACHINING
86.7 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEAL D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

137312 MLC
15-09-25

UNDER REVIEW

UP 15/9/25
LRF 15-501

UNDER REVIEW
M/H/M 15/7/20
URG 15-691

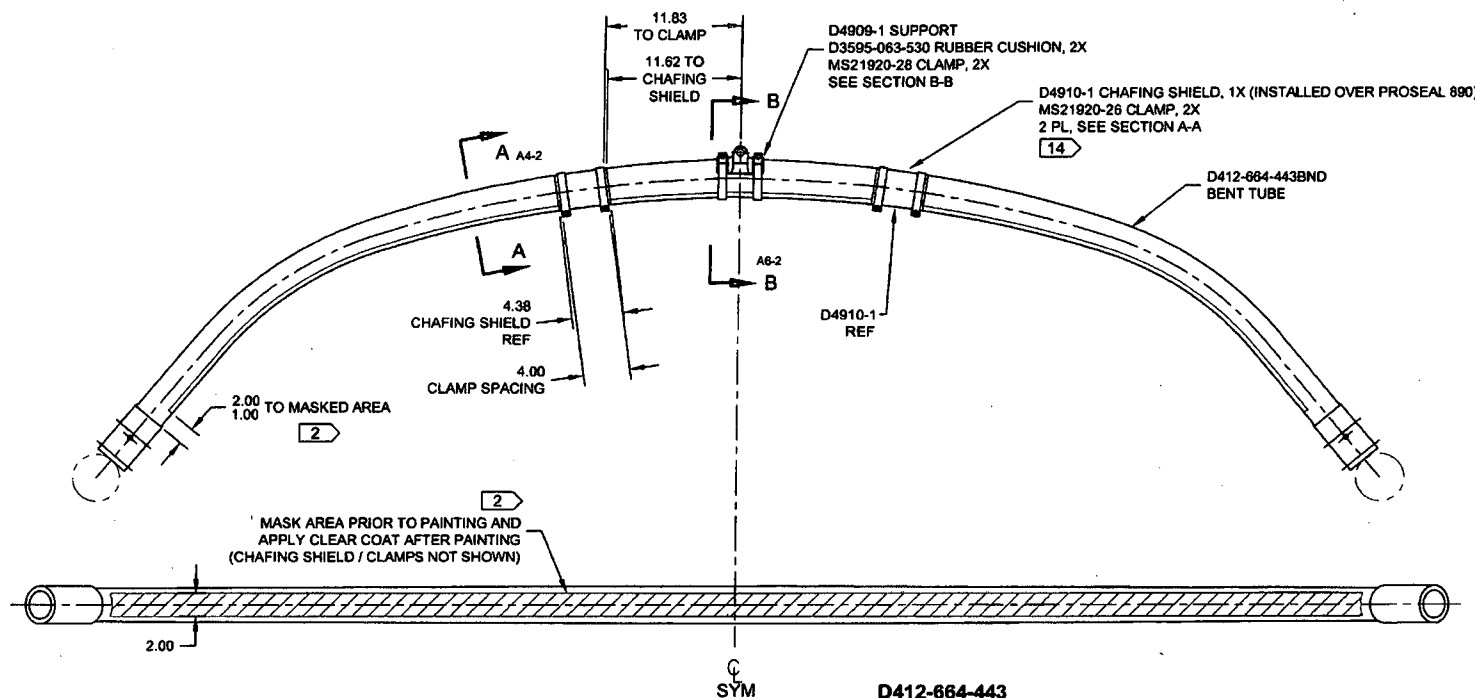
RELEASED
2014-05-26

A	NEW ISSUE	CP	14.04.01
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	14.04.01		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D412-664-443	REV. A SHEET 1 OF 4
TITLE CROSSTUBE ASSY (412 HI AFT)	SCALE NTS
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UNDER REVIEW

UNDER REVIEW

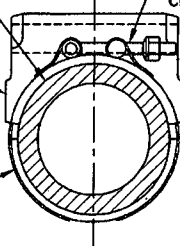


D412-664-443
ASSEMBLY DETAIL

12
APPLY 3M SCOTCH-WEELD DP460
BETWEEN D4909-1 SUPPORT AND
THE CROSSTUBE

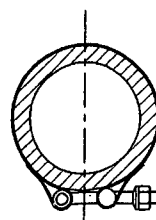
D4909-1
SUPPORT
REF

D3595-063-530
RUBBER CUSHION
UNDER CLAMP, REF



SECTION B-B D4-2
SCALE 4X

13 15
MS21920-28
CLAMP, REF



SECTION A-A C6-2
SCALE 4X

15
MS21920-26 CLAMP
REF

UNDER REVIEW
15/4/20

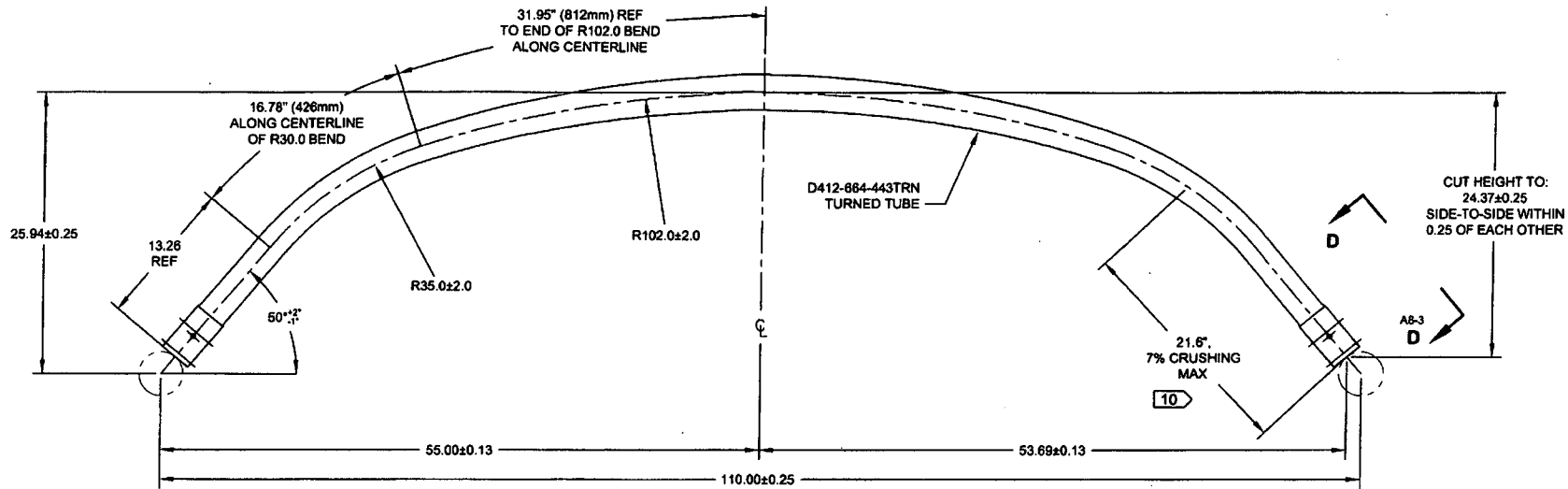
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14/7/20

RELEASED
2014-05-26
JMP

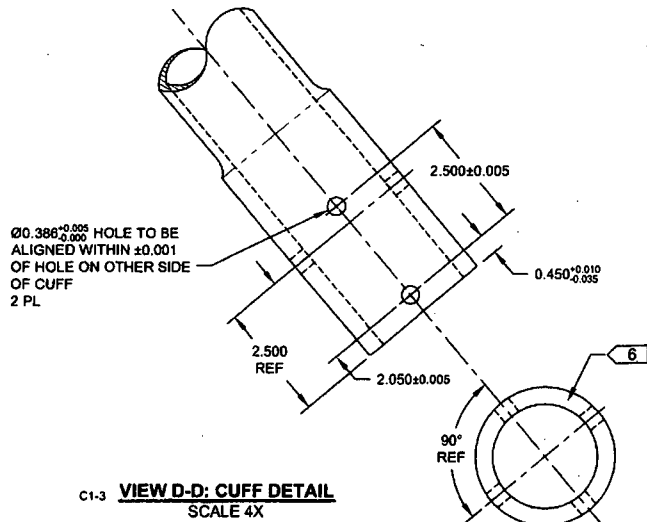
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DRAWN	DP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Dev	DRAWING NO.	REV. A
MFG. APPR.	Mp	D412-664-443	SHEET 2 OF 4
APPROVED	JMP	TITLE	SCALE
DE APPR.	DP	CROSSTUBE ASSY (412 HI AFT)	NTS
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UNDER REVIEW

UNDER REVIEW



D412-664-443BND
BENDING DETAIL



VIEW D-D: CUFF DETAIL
SCALE 4X

UNDER REVIEW
15/14/23

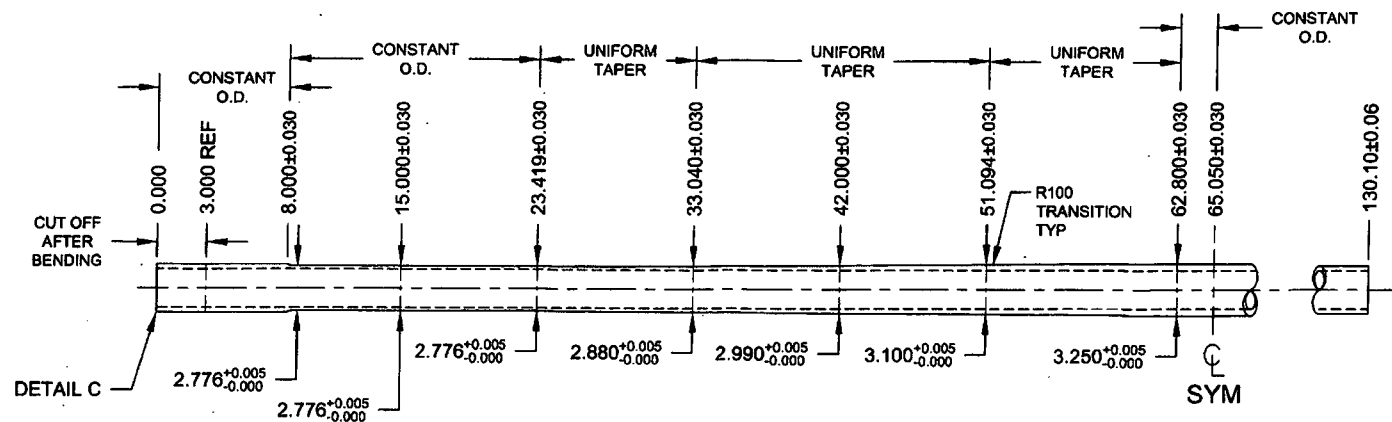
UNDER REVIEW
OK Pm/44 14/7/36

RELEASED
2014-05-26

DESIGN	<i>DP</i>	DART AEROSPACE LTD	
DRAWN	<i>DP</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>DW</i>	DRAWING NO.	REV. A
MFG. APPR.		D412-664-443	SHEET 3 OF 4
APPROVED	<i>DP</i>	TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI AFT)	NTS
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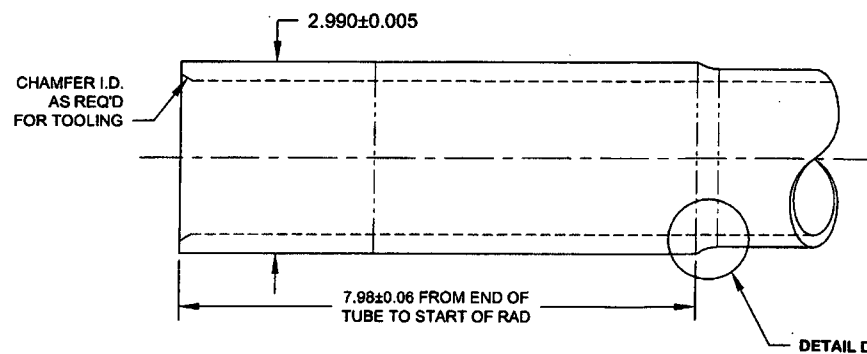
UNDER REVIEW



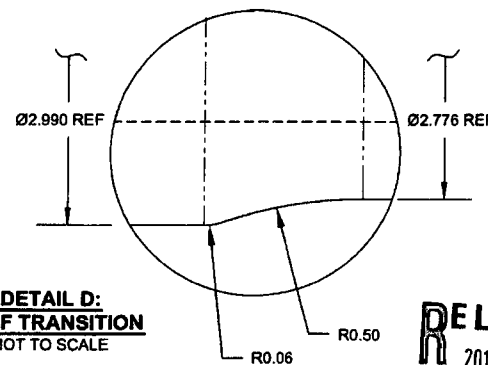
D412-664-443TRN
TURNING DETAIL

UNDER REVIEW

15/4/28



DETAIL C:
CUFF TRANSITION
SCALE 4X



DETAIL D:
CUFF TRANSITION
NOT TO SCALE

RELEASED
2014-05-26

DESIGN	DP	DART AEROSPACE LTD	
DRAWN	DP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DL	DRAWING NO.	REV. A
MFG. APPR.	DP	D412-664-443	SHEET 4 OF 4
APPROVED	DP	TITLE	SCALE
DE APPR.	DP	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
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UNDER REVIEW

UNDER REVIEW

D412-664-403 Stainless Steel Hardened Crosstube

setup

3.25" rollers

Bend lines are @ 32", 35" from centerline of tube

1.75" shims are used in the buggy for side bends

Middle Bend

Middle bend goes from 35" line with crosstube being on the large table of the machine.

Approach for middle bend is 2870 on both rollers. Run programs middle auto, middle 6 check.

Side Bends

Run programs side 1-10 down the taper from 32" tangent line. Approach is 2900 on Y roller and 3385 on W roller. Programs 1-5 go back to the tangent line ready for next bend. Program 6-10 release at the end. Approaches on programs 6-10 are on the first line of programs... Programs 11-15 run down taper for 9" then come back up to finish tube slowly, be careful with these programs...

Enjoy

Notes:

13/12/12 ran 1 tube, program middle 6 was not enough, prog middle 7 overbent slightly. will create middle 6b to be a halfway point. after program 7 we ran the tube as per folio. one side finished nicely at program 10, the opposite side finished nicely after running program 1 2 times, then 13 to finish. this left the tube closer to max tolerance on the span, 53.730/53.800.

15/06/03 middle auto has been made but, due to the long program, only contains programs 1-5. program 6 must be run separately prior to checking tube on wall.



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO10242**

Purchase Order Date 10/23/2015

PO Print Date 10/23/2015

Page Number 2 of 3

Order From :

VC-SKY001

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Chantal Lavoie

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA - (Free Carrier)

3	133190	D212-664-207 CROSSTUBE	10/23/2015	1.00	\$135.00	\$135.00
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Yes

10/23/2015

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$135.00

4	137312	D412-664-403 CROSSTUBE	10/23/2015	1.00	\$135.00	\$135.00
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Yes

10/23/2015

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$135.00

5	137870	D412-664-403 CROSSTUBE	10/23/2015	1.00	\$135.00	\$135.00
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Yes

10/23/2015

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Note:

10/23/2015

**skyservice****Work Order Traveler**
Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO26184	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 30242
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

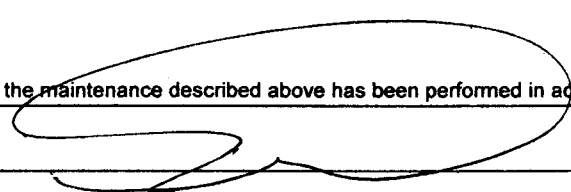
CARRY OUT NDT ON 6 CROSSTUBES AS PER PO30242

4 STAINLESS STEEL CROSSTUBES, ITEM ID# D412-664-403 , WORK ORDER ID# 137312, 137870, 137871, 137872

2 AFT CROSSTUBES , ITEM ID# D212-664-207 , WORK ORDER ID# 136262, 133190

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-13 ***NO CRACK FOUND*** PEN. ZL-56, MPO13600, UV M-20141, CLEANER SKC-S MPO13923 , DEV. MPO11715						OCT 23 2015	 
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	
			15	10-29			

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: OCT 23 2015
Name: RAFIK MELIKIAN		

DQA: AK Date: 15/12/09



QA Closed: AK Date: 15/11/27 **WORK ORDER NON-CONFORMANCE / UPDATE**

Work Order update only ☐

Work Order: <u>137312</u> Part No. <u>D412-664-123</u> NCR No. <u>15-5460</u>	DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Cross tube ☒</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>			Skid-tube ☐	Cross tube ☒	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																																																																																																																									
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